HANDS-ON NATURE MONITORING PROJECTS

The following is a list of hands-on "nature monitoring" measurement and observation projects in which individuals, families, or school classes can participate. Some are quite simple and some are more involved; some take place on a particular date or time period and others can be done year-round. The activities below encompass astronomy, botany, ecology, hydrology, meteorology, and ornithology. They all involve ways that an individual or a group can make observations of things in the natural world that can be shared online with interested persons worldwide. The activities are listed first, with more details about each one further below. Except for one, all these are national (or worldwide) programs, not restricted to Colorado. All of them can be great ways to get students involved and interested in observing and studying nature.

Please note - two unusual (once-or-twice in a lifetime?) astronomical events that will be visible this year, on May 20 and June 5; also links to Citizen Science Central, a clearinghouse for posting information about all types of citizen-participation nature study projects, nationwide.

(1) Great Backyard Bird Count: Feb. 17-20, 2012; http://www.birdsource.org/gbbc/
(2) Globe at Night 2012: Feb. 12-21, Mar. 13-22, Apr. 11-20; http://www.globeatnight.org
(3) Project BudBurst: springtime (plus fall too); http://neoninc.org/budburst/
(4) CoCoRaHS, Community Collaborative Rain, Hail & Snow Network: year-round; http://www.cocorahs.org/
(5) Colorado RiverWatch: all year http://wildlife.state.co.us/landwater/riverwatch/
(6) World Water Monitoring Day: Sep. 18, plus throughout the year: http://www.worldwatermonitoringday.org/
(7) The Great Worldwide Star Count http://www.windows2universe.org/citizen_science/starcount/
(8) Project FeederWatch: winter (Nov.-April) http://www.birds.cornell.edu/pfw/
(9) Audubon Society Christmas Bird Count: Dec. 14-Jan. 5 annually; http://www.audubon.org/bird/cbc/

(1) **Great Backyard Bird Count**: Feb. 17-20 2012; http://www.birdsource.org/gbbc/
"The 2012 GBBC will take place Friday, February 17, through Monday, February 20. Please join us for the 15th annual count! The Great Backyard Bird Count is an annual four-day event that engages bird watchers of all ages in counting birds to create a real-time snapshot of where the birds are across the continent. Anyone can participate, from beginning bird watchers to experts. It takes as little as 15 minutes on one day, or you can count for as long as you like each day of the event."

(2) **Globe at Night 2012**: February 12-21, March 13-22, April 11-20
"GLOBE at Night is an annual citizen-science campaign that encourages people all over the world to record the brightness of their night sky. During weeks when the Moon is not out during the early evening and the constellation of Orion can be seen by everyone everywhere, children and adults match the appearance of Orion with 7 star maps of progressively fainter stars found on the website, www.globeatnight.org . They then submit their measurements (e.g., which star map they chose) on-line with their date, time and location. More countries than ever before participated in the 2011 GLOBE at Night campaign. Nearly all of the 14,249 measurements were taken by 48 of the 115 countries."

(3) **Project BudBurst**: springtime (and fall too); http://neoninc.org/budburst/
Anyone can participate. Familiarize yourself with certain native plants from a list of those growing in your geographic area, then observe and report dates you observe for first leafing or flowering of these plants. "Project BudBurst has targeted 97 native trees, shrubs, wildflowers, and grasses for you to monitor throughout the year! With your help, we will be compiling valuable environmental information that can be compared to historical records. By recording the timing of the leafing and flowering of native species each year, scientists can learn about the prevailing climatic characteristics in a region over time."

(4) **CoCoRaHS**, Community Collaborative Rain, Hail & Snow Network: all year; http://www.cocorahs.org/
"CoCoRaHS is a unique, non-profit, community-based network of volunteers of all ages and backgrounds working together to measure and map precipitation (rain, hail and snow). By using low-cost measurement tools, stressing training and education, and utilizing an interactive Web-site, our aim is to provide the highest quality data for natural resource, education and research applications. It's easy to join, takes only five minutes a day and is a fun

way to learn about this wonderful natural resource that falls from the sky. We are striving to have 30,000-40,000 active observers by the end of 2013. COCORAHS is now in all 50 states (as well as the District of Columbia) (and Canada—starting with Manitoba)!"

Participants must register and order a high-capacity (4" diameter) rain gauge, which they will read and submit data from at approximately 7 a.m. each day. The CoCoRaHS website is a great source for daily measurements of local rainfall and snowfall in each community within your state or around the country; anyone can log in and access the daily data. [Let me put in an extra plug for this project; I participate, and it's a GREAT community effort!

(5) **Colorado RiverWatch**: all year http://wildlife.state.co.us/landwater/riverwatch/

A program that, "...started with six schools on the Yampa and grew to cover all watersheds in Colorado and 350 schools. Since 1989 we have involved over 60,000 individuals in Colorado, provided data on 3,000 stations covering over 300 rivers. We have also grown to include individuals, watershed groups and other entities, besides schools, in our program. River Watch is a statewide volunteer water quality-monitoring program operated by the non profit 501(c)3 Colorado Watershed Assembly in cooperation with the Colorado Division of Wildlife (CDOW). Our mission is to work with voluntary stewards to monitor water quality and other indicators of watershed health and utilize this high quality data to educate citizens and inform decision makers about the condition of Colorado's waters. Volunteers agree to monitor on a monthly basis. Samples are collected which the volunteers analyze for hardness, alkalinity, dissolved oxygen, pH and temperature. Additional samples are collected to be analyzed for total and dissolved metals..." Volunteers must register, receive training and equipment, and agree to conduct regular water monitoring in a selected local stream. All the data collected and archived are publicly accessible via their website.

(6) **World Water Monitoring Day**: Sep. 18, and throughout the year; http://www.worldwatermonitoringday.org/

"World Water Monitoring Day™ is an international education and outreach program that builds public awareness and involvement in protecting water resources around the world by engaging citizens to conduct basic monitoring of their local water bodies. In 2009, over 120,000 people in 81 countries monitored their local waterways, and in 2010, **over 200,000** people in **85 countries**! Celebrate with us on September 18, or host your World Water Monitoring Day anytime from March 22 until December 31.

An easy-to-use test kit enables everyone from children to adults to sample local water bodies for a core set of water quality parameters including temperature, acidity (pH), clarity (turbidity) and dissolved oxygen (DO). Results are shared with participating communities around the globe through the WWMD Website."

The Basic Test Kit ($13 plus $8.10 shipping) includes one set of hardware and enough reagents to conduct up to 50 rounds of testing for pH, dissolved oxygen, temperature, and turbidity. A Classroom Kit, $49 plus $9.75 shipping, includes the same test materials but with five sets of hardware.

(7) **The Great Worldwide Star Count**: October 14-28 2011; October __-__ 2012

http://www.windows2universe.org/citizen_science/starcount/

"During this international event, we ask everyone to go outside, look skyward after dark, note the stars they see in certain constellations, and report what they see online. The 2010 Great World Wide Star Count is over. We surpassed our goal of 2,000 observations this year—almost *4,500 observations were submitted* by wonderful observers like you! Check the website as the year progresses to find out the exact dates of the 2012 Star Count.

(8) **Project FeederWatch**: Nov.-April; http://www.birds.cornell.edu/pfw/

"Project FeederWatch is a winter-long survey of birds that visit feeders at backyards, nature centers, community areas, and other locales in North America. FeederWatchers periodically count the birds they see at their feeders from November through early April and send their counts to Project FeederWatch. FeederWatch data help scientists track broadscale movements of winter bird populations and long-term trends in bird distribution and abundance. Project FeederWatch is operated by the Cornell Lab of Ornithology and Bird Studies Canada. Anyone with an interest in birds can participate! FeederWatch is conducted by people of all skill levels and backgrounds, including children, families, individuals, classrooms, retired persons, youth groups, nature centers, and bird clubs.

There is a $15 annual participation fee which covers materials, staff support, web design, data analysis, and a year-end report (Winter Bird Highlights). Participants receive a Research Kit, which contains instructions, a bird identification poster, a wall calendar, a resource guide to bird feeding, and a tally sheet—everything you need to

start counting your birds. U.S. participants receive a subscription to the Lab of Ornithology's newsletter, BirdScope.

(9) **Audubon Society Christmas Bird Count**: Dec. 14-Jan. 5 annually; http://www.audubon.org/bird/cbc/ Conducted by local Audubon Society groups. "The Christmas Bird Count season is December 14 through January 5 each year. Your local count will occur on one day between those inclusive dates. There is a specific methodology to the CBC, but everyone can participate. The count takes place within "Count Circles," which focus on specific geographical areas. Each circle is led by a Count Compiler. Therefore, if you are a beginning birder, you will be able to join a group that includes at least one experienced birdwatcher. In addition, if your home is within the boundaries of a Count Circle, then you can stay home and report the birds that visit your feeder once you have arranged to do so with the Count Compiler. In either case, if you have never been on a CBC before your first step is to locate and contact your local Count Compiler to find out how you can volunteer. There is a $5 fee to participate in the CBC for all field participants aged 19 or older."

Citizen Science Central is a nationwide clearinghouse for all kinds of public-participation projects one can join, ranging from astronomy to zoology. See:
http://www.birds.cornell.edu/citscitoolkit/projects/new-gateway-home#about-the-new-gateway

Unique astronomical events: Two such events (of the predictable, as opposed to the unpredictable sort) are going to take place this spring. On May 20 there is going to be a "ring of fire" annular eclipse of the sun, visible in the western U.S. along a path covering parts of CA/OR, NV, UT, AZ, NM, TX. This is an eclipse in which the moon is directly between the earth and sun, but the relative distances of the three bodies are such that the moon's disk is not large enough to completely cover the sun, so the sun appears as a fiery ring around the silhouette of the moon. For details and a map showing the path of the eclipse, see NASA Science News at http://science.nasa.gov/science-news/science-at-nasa/2012/27jan_annulareclipse/ The eclipse, which will take place just before sunset that day, will only be visible as a partial solar eclipse in Denver, but Albuquerque, NM will be exactly centered in the path of the annular eclipse.

And, on June 5, a transit of Venus across the face of the sun will be visible across all of the U.S., also taking place before and at sunset. It can be viewed via the same techniques as used for viewing sunspots. For more info see http://science.nasa.gov/venus-transit/
http://www.astrosociety.org/education/publications/tnl/78/78.html or

Last chance to see! The last transit of Venus was in 2004 (they occur in pairs 8 years apart) and the next will not be until 2117 and 2125. A total solar eclipse will be visible on a path across the U.S. (from Oregon to South Carolina) on Aug. 21, 2017; the next annular eclipse visible in parts of the conterminous U.S. will be in 2048.

Cautions, of course: Both the eclipse and the transit will require indirect observation methods or proper filters to view safely since the sun is not completely blocked and will be bright enough to cause eye damage if viewed directly.